Baileya

A Quarterly Journal of Horticultural Taxonomy

Vol. 8 MARCH 1960 No. 1

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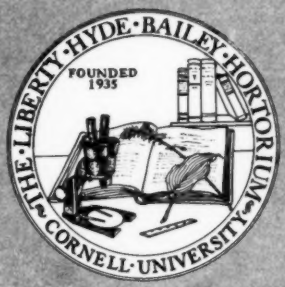

BAILEYA. - A quarterly journal devoted to the botany of cultivated plants and especially to their identification, nomenclature, classification, and history in cultivation. Editor: William J. Dress.

Price: $3.00 per year, net, postpaid, in funds payable at par in United States currency in New York. Single copies: from Volumes 1-7 (1953-1959), 50 cents each; from Volume 8 (1960) onward, 75 cents each. Address subscriptions and requests for back numbers to The Bailey Hortorium, Cornell University, Ithaca, New York. Make all remittances payable to BAILEYA.

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Published by the New York State College of Agriculture,
A Unit of the State University of New York,
at Cornell University, Ithaca, New York.

Second Class postage paid at Ithaca, N. Y.

BAILEYA
Vol. 8 March, 1960 No. 1
Mailed at Ithaca, N. Y., March 31, 1960

Notes on Cultivar Names

George H. M. Lawrence

It is of considerable interest to observe the extent to which the concept and term of cultivar have become accepted throughout the world of cultivated plants. An increasing number of journals and books originating in Britain, America, the Scandinavian countries, and those having Romance languages are taking it up. In Italy the term cultivar has now virtually displaced the older varietá in journals of agriculture, agronomy, vegetable crops, and ornamentals. Throughout all of these countries, however, and in English-speaking countries in particular, there is one area where somewhat of a psychological barrier exists to complete comprehension and adoption of the cultivar concept. It is that which relates to cultivars that long have been known by names in Latin, as opposed to those in a modern language. There is historical reason for this.

The early herbalists wrote their books in Latin, for this was the universal language of lettered people of the day. When, in various countries, the vernacular became also the language of literature, Latin became less important as the written language. Despite this decrease in use, Latin continued—and is used today—as the universal language for the scientific names of plants and animals. Until very recently this was as true for the names of garden varieties of many plants as for those known only in the wild. Linnaeus in 1753, for example, accepted Bauhin's name of Brassica oleracea var. capitata for the cabbage.

The rate of increase in the number of ornamental cultivars among herbaceous annuals or perennials long has been much greater than among new cultivars of woody plants. With this has occurred, also, the dropping-out of older ones in favor of the new ones. These evolutions have occurred simultaneously in many countries, in many language areas. The need for new names for cultivars has risen at a rather rapid rate. For all of these reasons, it is understandable that the use of names in a modern language, in the language of the country where the new cultivars originated, would supplant the older practice of naming all garden varieties in Latin. In addition, when these herbaceous plants were developed for the beauty of their flowers, as was usually the case, it was only natural that their names should commemorate those of beautiful ladies. A new language of plant names came into existence.

Concurrently, the cultivars of many groups of woody plants, especially those in which characters other than flowers were the most important features, continued to receive names in Latin. Here the number named in any given decade was usually relatively small for a particular group. The cultivar of a woody plant, when meritorious, could be expected to remain in cultivation for perhaps a half-century or longer; usually it did not displace one of perhaps inferior qualities. Why did these cultivars continue to be named in Latin? There are several reasons. For the most part their distinctiveness was to be found in characters of foliage (color, dissection, hairiness or hairlessness), in form of the plant (weeping, prostrate, conical, fastigiate), or in color of the fruit, in hardiness, growth-rate, and less commonly in form or color of the flower. Except when named to commemorate an originator or discoverer, there was little glorification or compliment to be achieved by naming them for persons — least of all ladies of beauty or perhaps renown in the arts. From early times, however, there were exceptions among those woody plants, grown primarily for their flowers, such as the camellias, roses, and lilacs, and to some extent, the rhododendrons. For the last two centuries many cultivars in these four woody genera have been named descriptively in modern languages.

In addition to the association of permanence that is coupled with a Latin name for a cultivar of promising longevity, there is also the more subtle association with the Latin cultivar name, of the same permanence and importance associated with a species name in Latin. Furthermore, some horticulturists surely have found greater satisfaction and sense of accomplishment in using a Latin epithet for a new cultivar, and accompanying it with the same formal Latin description as is required for a new species or new botanical variety, than they would have experienced if they had merely used a name drawn from their mother-tongue.

The International Code of Nomenclature for Cultivated Plants directs that, for those cultivars that were named prior to 1 January, 1959, the existing valid name must be retained. It is identified as a cultivar name by being capitalized and preceded by the designation cv. or by being enclosed within single quotation marks. It may be assigned to a species (Fagus sylvatica 'Asplenifolia'), to a genus (Syringa 'Snowflake'), or to a common name of a genus ('Schwedleri' Maple). The cultivar name, even when in Latin, may not be printed in italics, as would be the Latin name of the genus or species or a botanical variety. It should be set in the same type-face as a cultivar name in any modern language.

The same Code directs that after 1 January, 1959, new cultivar names published in Latin form have no standing. However, if a new variant is first described after this date as a botanical variety,

and in accordance with the botanical Code, but later is found to be a cultivar, the name given it as a botanical variety stands but is treated henceforth as a cultivar name. It is the intent of the Code, and the spirit of the cultivar concept, to treat the nomenclature of all new cultivars alike, regardless of whether the plants are woody or herbaceous, and whether bearing a name in Latin or in a modern language. This uniform treatment prescribes that names newly created, after 1 January, 1959, have validity only when in a modern language. This serves also to differentiate in the future those variants that are minor populations in the wild — botanical varieties — from those that are of importance only in cultivation.

In the issue of Baileya for September, 1959, Green and Keenan proposed a broadening of Art. 15 of the cultivated plant Code, so that any botanical variety or plant so treated and having a Latin name will continue to retain that name in the event the variant is found to be a cultivar and not a botanical variety. In the expectation that this proposal will be adopted in the next edition of the Code, it is being followed in articles for inclusion in Hortus III as if it were an official rule. It is reasonable, and its adoption will assure increased stability of cultivar names.

The proposed modification of Article 15, discussed above, would not admit the use of Latin names for any new cultivars. It applies only to plants which, after 1 January, 1959, are transferred in category from the rank of botanical variety to cultivar, and provides that the Latin name which was correct for the plant in the category of varietas be retained for the plant in its new category of cultivar. Here, the plant is not new; the only novelty involved is recognition that it is a cultivar and not a member of some strictly botanical category, i.e., species, varietas, or forma.

Horticulturists concerned with accurate identification of their plants recognize the importance of distinguishing between botanical varieties and cultivars. Any device that will facilitate the gardener's doing this becomes a useful aid. The switch to the use of fancy names for cultivars of woody plants instead of those in Latin is such a device. It is not, as some have held it to be, a sanctification of the name that is in Latin (that of the botanical variety), nor an implication that any sort of name (i.e., one in a modern language) is good enough for the cultivar. It is the presentation of a usage of long standing —the retention of Latin names for taxa of plants in the wild, at all classification levels. These populations — the botanical varieties — have persisted in many instances for a time longer than man has had written records; they are self-perpetuating when left undisturbed in nature. This cannot be said of the cultivar, which, when left alone in nature to compete with established populations, either reverts after a few generations to its ancestral form or dies because it cannot compete for survival.

Common versus Cultivar Names

Correspondence and discussions with many American horticulturists who are endeavoring to become better-informed about cultivars and cultivar names indicate that a clear distinction is not always made between common names and cultivar names. Too, it seems not always to be realized that some widely grown cultivars may have both a common name and a cultivar name — and that those two names may be slightly different or very different.

Common names, whether applied to genera, species, or cultivars, are names that are a part of common language. They include such names as pine, oak, cabbage, English ivy. They exist in every spoken language, and they stand outside the directives of any code of nomenclature.

Cultivar names, on the other hand, are assigned to a particular plant by some individual and generally at the time of its introduction into commerce. A given cultivar has one correct and official cultivar name. Under some conditions, associated with use of a cultivar in two or more language areas, it may have a second name, in a language other than that of its origination, which is known as a Commercial Synonym. The rose 'Peace' is an example, for it was first named and introduced in France as 'Mme. Meilland'; the latter is still its correct and official cultivar name.

Examples of cultivars having different common names are not abundant, but when encountered they do create confusion for those persons who would hold the common name properly to be the cultivar name. Examples include: the Bechtel crab, the official name of which is Malus ioensis cv. 'Plena'; Sargent's weeping hemlock, Tsuga canadensis cv. 'Pendula'; and the Rivers crab, Malus spectabilis cv. 'Riversii'. Sometimes a well-known but more recent, and hence illegitimate, cultivar name becomes the common name when displaced by the older legitimate and official cultivar name. This is true of the begonia 'Peach Leaf', better known in some areas by a later synonym, Washington Street begonia. The use of displaced but better-known cultivar names as common names is not contrary to the Code, but it is most important to keep the two kinds of names separate. Never enclose common names in single quotation marks, since these are reserved to identify cultivar names.

Notes on the Cultivated Polemoniaceae
3. Ipomopsis

John Ingram

In spite of the fact that Ipomopsis was described, as a genus, by Michaux in 1803, it has not been accepted by botanists until only recently. The conservative approach in vogue during the time of Asa Gray has been followed even by botanists known not to be conservative, and so after 150 years there are fewer than five manuals or floras, dealing with wild or cultivated plants, which recognize the genus Ipomopsis; the conventional treatment has been to identify these species as members of the heterogeneous genus Gilia, with one species each having been assigned to Leptodactylon and Loeselia.

An attempt to revive Ipomopsis as a distinct genus in the family Polemoniaceae was made by Dr. Edgar Wherry (Bartonia 18: 56-58, 1936). However, his suggestion obviously fell on deaf ears since subsequent treatments still persisted in treating species of the Ipomopsis alliance in the conventional manner. Twenty years after Wherry's unheeded recommendation, Dr. Verne Grant restudied the problem and published "A Synopsis of Ipomopsis" (El Aliso 3: 351-362, 1956), in which he defined the genus and offered conclusive evidence on why and how Ipomopsis should be recognized as a genus. Grant's conclusions on this matter are in conformity with the current trend of removing discordant elements from Gilia, which has resulted in the establishing of several natural genera as well as making Gilia itself a more natural genus.

Members of the genus Ipomopsis are identified easily as members of the Polemoniaceae in that their flowers have a 5-merous perianth, gamopetalous corolla, 5 epipetalous stamens, a superior 3-loculed ovary, and a 3-branched style. The cultivated species are almost invariably listed in catalogues as species of Gilia, from which they differ in that they are mostly summer-blooming perennials or biennials (few are annuals), having stems with well-developed leaves (the leaves bearing horny mucros on the tips of their lobes), individually bracted flowers, and seeds which are usually straw-colored to pale brown and curved.

Ipomopsis is strictly a New World genus of about 24 species, with its center of distribution in the Rocky Mountains and the adjacent plains. Species also inhabit the area west to the Pacific Coast, south into Mexico, and east throughout Texas to Florida and North Carolina. One species is known from southern South America, and Ipomopsis rubra has spread from cultivation in certain localities in the midwest to northeastern United States.

Key to the Cultivated Species of Ipomopsis

1. Flowers 1.5-5 cm. long, in open or thrysoid panicles.
   2. Flowers mostly pink, scarlet, or red, with yellow mottling inside, in thyrsoid panicles; the corolla tubular-funnelform.
      3. Plants almost glabrous, sometimes glandular on the pedicels and peduncle; corolla glabrous, the lobes elliptic to ovate, spreading (fig. 3); flowers scentless. . . . . I. rubra
      3. Plants glandular-pubescent to pilose; corolla pubescent outside, the lobes lanceolate or linear, reflexed (fig. 2B); flowers fragrant. . . . . I. aggregata
   2. Flowers light blue to white, in open, rather flat-topped panicles; corolla salverform (fig. 1). . . . . I. longiflora
1. Flowers 0.9-1.2 cm. long (fig. 2A), in clusters arranged in spikes. . . . . I. spicata

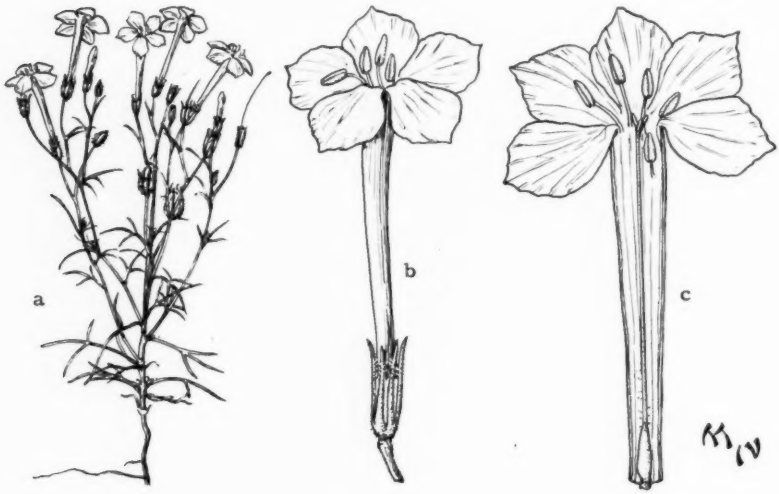

Fig. 1. Ipomopsis longiflora: a, habit × 1/3; b, flower × 1 1/2; c, corolla expanded × 1 1/2.

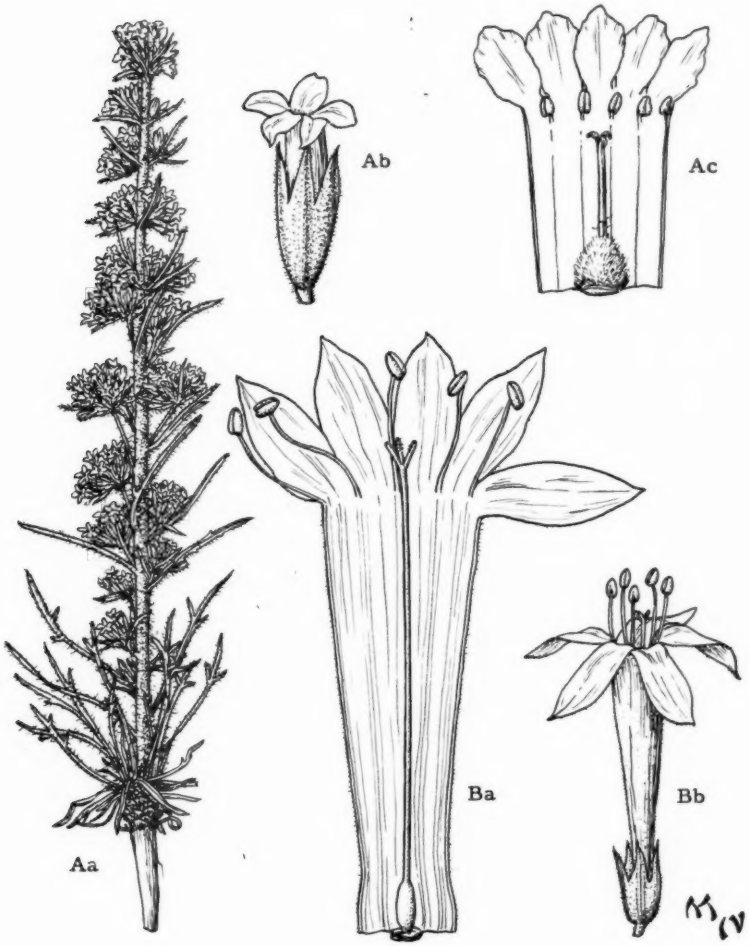

Fig. 2. A, Ipomopsis spicata: a, habit × 1/2; b, flower × 3; c, corolla expanded × 4. B, Ipomopsis aggregata: a, flower × 2; b, corolla expanded × 3.

Ipomopsis rubra (Linnaeus) Wherry, Bartonia 18: 56, 1936. [Polemonium rubrum Linnaeus, Species Plantarum, p. 163, 1753; Gilia rubra (Linnaeus) Heller, Contributions from the Herbarium of Franklin and Marshall College 1: 81, 1895; Gilia coronopifolia (Willdenow) Persoon, Synopsis Plantarum 1: 187, 1805]. Standing cypress. This is the species most commonly cultivated, being offered usually as Gilia coronopifolia. It is a coarse, almost glabrous, mostly unbranched biennial growing to 1 m. and more tall, with flowers scarlet to yellow dotted with red inside, arranged in long, rather narrow thyrsoid panicles. Individual plants growing in nature vary considerably in size, depending on the nature of the soil where they happen to become established.

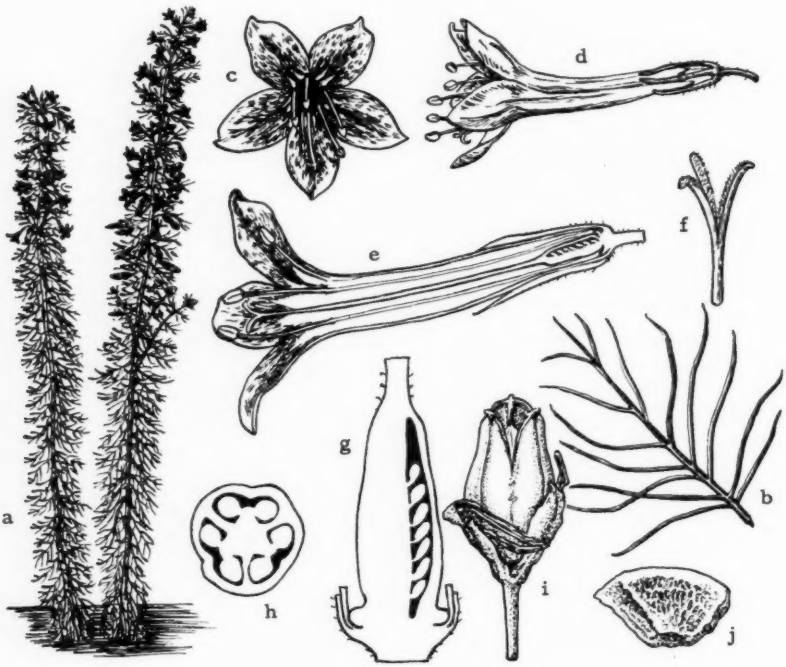

Fig. 3. Ipomopsis rubra: a, habit × 8; b, leaf × 1/2; c, flower, face view × 1 1/4; d, flower, side view × 1 1/4; e, flower in vertical section × 1 1/2; f, stigma × 4; g, ovary in vertical section × 6 1/2; h, ovary in cross-section × 8; i, capsule × 2 1/2; j, seed × 8.

Ipomopsis aggregata (Pursh) V. Grant, El Aliso 3: 360, 1956. [Cantua aggregata Pursh, Flora Americae Septentrionalis 1: 147, 1814; Gilia aggregata (Pursh) Sprengel, C. Linnaei . . . Systema Vegetabilium. Editio decima sexta curante C. Sprengel 1: 626, 1825]. Skyrocket, scarlet gilia. This is the next most frequently cultivated member of the genus. In fact, the preceding species and this one have a marked resemblance to each other and are occasionally confused; however, Ipomopsis aggregata can be distinguished from I. rubra by its narrow reflexed corolla-lobes. Ipomopsis rubra also is a much coarser plant, with a typically more compact inflorescence. Ipomopsis aggregata comprises at least four subspecies, which range over much of the western United States. This complex is now receiving critical investigation by at least three western botanists.

Ipomopsis longiflora (Torrey) V. Grant, El Aliso 3: 361, 1956. [Cantua longiflora Torrey, Annals of the Lyceum of Natural History of New York 2: 221, 1828; Gilia longiflora (Torrey) G. Don, A General System of Gardening and Botany. . . 4: 245, 1837]. At first glance, one might think that Ipomopsis longiflora must be a member of the genus Phlox, which it resembles in its pale blue to white salverform corollas which have long narrow tubes expanding only slightly toward the limb. The corolla-shape in conjunction with the inflorescence, which tends toward being flat-topped, helps one to separate this species very readily from the other members of the genus. Anyone wishing to collect this species in its native home will find it growing natively from Nebraska to Utah and south to Arizona and Texas.

Ipomopsis spicata (Nuttall) V. Grant, El Aliso 3: 361, 1956. [Gilia spicata Nuttall, Journal of the Academy of Natural Sciences of Philadelphia II. 1: 156, 1858]. The arrangement of the white to cream-colored flowers in capitate clusters arranged in spikes is the characteristic which sets it apart from the other cultivated species. It is uncommon in cultivation. Its range in nature is from South Dakota and Wyoming to Kansas, Utah, and New Mexico. Also rare in cultivation is subspecies capitata (Gray) V. Grant, which has its flowers in globose capitate clusters, and calyces with long silky hairs. It is a native of the high mountains of central Colorado.

American Sources of Plants and Seeds of Herbs

George Kalmbacher[1]

The appended list of sources of herb material offered by American dealers (other than purely local dealers) is the product of a search that aimed to include all such sources in this country. If there are any omissions, it is requested that the names of those not listed be sent to the writer.

In previous issues of Baileya were published "Sources for Rock Garden Plants," (Vol. 4: 128, 1956) and "Sources of Native Temperate-American Plants," (Vol. 2: 124-125, 1954). In one part of Plant Buyers Guide, Sixth Ed., there are listed the dealers of some families or parts of families constituting specialist groups, such as Orchids, Bromeliads, Gladiolus, etc. This list of sources of herb material, added to those groups mentioned above, most likely covers all special groups except dealers in succulents.

The interest in and popularity of herbs as attested by the number of dealers can surely be further expanded. Not only are the plants individually of interest, but an herb garden permits of formal designing. Of course, the main factor influencing the popularity of growing herbs today is their use in cooking, and one or another kind can be used with every course of a meal. Food and drink (non-alcoholic as well as beer, wines, liqueurs), candy and other confections, perfumery, cosmetics, and medicines — all reap benefits from the use of herbs. One attraction not found in other groups of plants is the refreshing fragrance of the leaves of many kinds.

No other group of plants is so stimulatingly connected by several avenues with our culture and the civilization of the Middle Ages. Grow some of the plants of old lore and learn some of their intriguing nonsense! Mrs. M. Grieve, in A Modern Herbal, speaks of one plant that was recommended as an antidote for the bite of sea-serpents (I have forgotten what it was, but will look it up in case anyone gets bitten and must know.)

However, not only do medicinal herbs enlarge the enjoyment of this group of plants, with both useful and useless kinds, but the herb garden can be extended to include any plant useful as an old-time source of products important in household economics, such as fibres and dyes.

[1] Brooklyn Botanic Garden, Brooklyn, New York.

I wish to express my appreciation to Mr. Harry Cohalan, gardener for the Rochester Museum of Arts & Sciences (where a new herb garden has been established for the public over the past two years), for the good basic list he gave me to start with.

Of the sources named below, those preceded by an asterisk (*) have especially extensive lists which often include the unusual.

Plants and Seeds

*Caprilands Herb Farm, Coventry, Connecticut.
Carroll Gardens, Westminster, Maryland.
Farmer Seed & Nursery Co., Faribault, Minnesota.
*Greene Herb Gardens, Greene, Rhode Island.
*Hav'alook Gardens, 10045 W. Grand River, Fowlerville, Michigan.
*The Herb Cottage, Washington Cathedral, Mt. St. Albans, Washington 16, D. C.
*Merry Gardens, Camden, Maine.
Pearce Seed Co., Moorestown, New Jersey.
*Plantation Gardens, Rustburg, Virginia.
*The Potters of Baraboo, Inc., Baraboo, Wisconsin.
Putney Nurseries, Inc., Putney, Vermont.
Westover Nursery Co., 8100 Olive St., St. Louis 24, Missouri.

Seeds

F. W. Bolgiano & Co., 411 New York Ave. N.E., Washington 2, D.C.
*The Cottage Herb Farm, Marlboro, New Hampshire.
Henry Field Seed & Nursery Co., Shenandoah, Iowa.
Chas. C. Hart Seed Co., Wethersfield 9, Connecticut.
Indiana Botanic Gardens [commercial name], Box 5, Hammond, Ind.
St. Louis Seed Co., 411 No. Broadway, St. Louis 2, Missouri.

Plants

Hemlock Hill Herb Farm, Litchfield, Connecticut.
*Logee's Greenhouses, Danielson, Connecticut.
*Sunnybrook Farms Nursery, 2825 Mayfield Rd., Chesterland, Ohio.
Taylor's Garden, 2649 Stingle Ave., So. San Gabriel, California. (Shipping to western states only.)
*The Tool Shed Herb Nursery, Salem Center, New York.
*Village Hill Nursery, Williamsburg, Massachusetts.
White Flower Farm, Litchfield, Connecticut.

Scented Geraniums

Wilson Bros., Roachdale, Indiana.
(Other sources usually include scented geraniums also.)

Fig. 4. Gaillardia pulchella. From L'Héritier de Brutelle, Virgilia helioides, Monographie, 1788.

The History of Cultivated Gaillardias

Warren P. Stoutamire[1]

In the early 1780's, perhaps in 1783, a "M. le comte d'Essales, chevalier de Saint-Louis," brought seeds of a new and attractive annual to France from "Louisiana." The plants were propagated for two years in the Royal Botanical Gardens and described by Fougeroux de Bondaroy in two papers dated 1786 and 1788. The manuscript copy of Fougeroux's 1786 paper, accompanied by the original drawing from which engravings were made, is deposited at the Philadelphia Academy of Sciences (J. Ewan, personal communication). The species was described as a new genus and named for M. Gaillard, "a French gentleman of Charrentonneau." These are the first references to the genus Gaillardia and to the frequently cultivated G. pulchella.

Since this time several other species of Gaillardia have been introduced to cultivation and new hybrids have resulted. The temporary cultivation of several of these species introduced into the horticultural literature new names which have occasionally been applied incorrectly to other species in the genus. There has also been a multiplication of cultivar names (at least forty cultivars have been listed in American and European catalogues in the past decade) which can be a course of confusion. Two species are commonly grown as garden plants, and they are the cultivated representatives of a genus of about fifteen native species, most of which occur in the southwestern United States and adjacent Mexico. Gaillardia aristata, native of the Rocky Mountains and northern plains, occurs as far north as British Columbia, and G. pulchella and G. lanceolata extend the genus to the south Atlantic states. One species, G. megapotamica, occurs in northern Argentina.

Gaillardia pulchella

This is a polymorphic species which occurs today in a large area which includes parts of Kansas, Colorado, Oklahoma, Texas, New Mexico, Arizona, and northern Mexico, and occupies sandy areas eastward along the coast to Florida and north to Virginia. The eastern populations are much more variable than the Texas coastal forms to which they are closely related, and a high proportion of tubular rays, unusual colors, and semi-double "flowers" suggests

[1]Cranbrook Institute of Science, Bloomfield Hills, Michigan. This work supported in part by National Science Foundation grant No. G-3943.

that this has come about through the activities of man—that the plants have escaped from cultivation. I cannot be sure, from the descriptions by Fougeroux and the illustrations published by himself and others, which of the "Louisiana" races was originally introduced to France. The coastal subspecies is the more likely candidate on morphological grounds.

The taxon was lost to cultivation in France about 1791 (DeCandolle, 1836) but not before having been introduced in England about 1787 (L'Héritier, in Smith, 1804). New seed collections were made by Thomas Drummond in Texas (Sweet, 1835; Hooker, 1834, 1837) and grown in England. Following the Drummond introductions, forms with tubular rays and unusual colors appeared sporadically in both wild and cultivated plants and were promptly described. The only nineteenth-century cultivar persisting in cultivation today appeared in Germany in 1881 and twelve horticultural journals illustrated it during the year (Stapf, 1930). This race, which has tubular ray-flowers mixed among the disk-flowers, was named Gaillardia Lorenziana.

No radically new cultivars have been produced since the introduction of 'Lorenziana', with the exception of the larger tetraploid strains of this cultivar which have been placed on the market during the past few years under the names 'Tetra Fiesta' and 'Tetra Giant'. Cultivars which are most frequently listed in American and in a few European catalogues of the past decade include: Fiesta, Fireball, Gaiety, Indian Chief, Lorenziana, Red Giant, Sunshine, Tetra Fiesta, and Tetra Giant.

Gaillardia aristata

The second species of importance to horticulture, Gaillardia aristata, was described by Pursh in 1814 from a specimen collected by Lewis and Clark in Montana in 1806. Thomas Nuttall, in the meantime, had collected seed of this perennial, yellow-rayed species on his trip up the Missouri River in 1811, and offered it for sale as Virgilia grandiflora in Fraser's catalogue (Nuttall, 1813). More seed collections were made by David Douglas along the Columbia River and sent to the Royal Horticultural Society in 1827 (Lindley, 1828). The species was figured under several names and was confused with Gaillardia pulchella. No horticulturally valuable forms of G. aristata have appeared to the present time and it has been replaced almost entirely by the following hybrid derivative.

Gaillardia × grandiflora

The annual, predominantly red-rayed G. pulchella was grown with the perennial, yellow-rayed G. aristata in European gardens for a number of years. The species hybridized spontaneously in

the gardens of the nurseryman, Gallopin, near Liége, and the hybrid was brought to the attention of both Van Houtte (1857) and Charles Lemaire (1857), who published the new species almost simultaneously. Van Houtte presumably has priority, since his article is referred to by Lemaire. The hybrid was a vigorous race of plants combining the richly colored rays of G. pulchella with the perennial habit of G. aristata, and it was larger and more vigorous than either parent. Van Houtte suggested that the new cultivar was a backcross of the F_1 to G. aristata; Lemaire was of the opinion that it was a direct hybrid.

Gaillardia × grandiflora is more showy and easier to grow than G. aristata, and has almost totally replaced that parent in horticulture. G. aristata is still offered by dealers in wild flowers, but the species is no longer listed in general gardening catalogues. Many color forms of G. × grandiflora have been selected, some of which are very similar to the wild G. aristata. The two species can be distinguished on physiological as well as on morphological grounds. Gaillardia aristata will not flower without a cold treatment, whereas G. × grandiflora, with genes from the annual G. pulchella, will often flower the same season that seeds are planted. Gaillardia aristata never has the deep-red ray color of many G. × grandiflora cultivars, and is usually less robust in growth, at least outside its native Rocky Mountain area. Some cultivars of G. × grandiflora which have been offered for sale during the past decade are: Aurea Pura, Baby Cole, Bremen, Burgundy, Dazzler, Goblin, Golden Goblin, Golden Goddess, Goldkobold, Grandiflora, Aurea, Compacta, Maxima, Superba, Kobold, General Patton, Monarch, Mr. Sherbrooke, Nana Nieske, Portola, Ruby, Sun, Sun God, Sunset, Tangerine, The King, The Prince, The Warrior, Tokaier, Tokaj, Tokay, and Yellow Queen. The species is adaptable to railroad fills and roadsides in areas where neither parent occurs naturally. I have seen it flourishing in such habitats in New Mexico, Utah, Indiana, and Michigan, and it undoubtedly occurs elsewhere as an escape.

Cytology

All wild and cultivated races of G. pulchella which I have examined so far have a somatic chromosome number of 34. Collections of G. aristata from Idaho, Utah, and North Dakota also have this number, while races originating in Montana, Wyoming, and Colorado are tetraploid with approximately 72 chromosomes. Thomas Nuttall's collections of Gaillardia aristata were probably made near Fort Mandan in North Dakota (Pennell, 1936). Pollen measurements of herbarium specimens from other areas of the state suggest that the populations are diploid, and one population from Devil's Lake, North Dakota, is diploid. The collections made by David Douglas along the Columbia River were also probably diploid, if pollen-size

measurements of present day populations can be used as criteria. Thus the collections of Gaillardia pulchella and G. aristata being grown in Europe during the first half of the nineteenth century were probably diploid.

The first notices of their hybrid, G. × grandiflora, in 1857, stressed the fact that it was generally larger and more vigorous than either parent. The new species is an allotetraploid with approximately 72 chromosomes and all cultivars of the species which I have examined are tetraploid.

Other species in cultivation

I have seen only two other species listed in catalogues, and these are not commercially available at the present time. Gaillardia lanceolata Michaux, a polymorphic species of the southeastern and south-central states, has been listed in the past by the Pearce Seed Company. Some collections of this species which I have grown are very attractive, and perhaps are suitable for the rock garden. Some races are spreading and low, while others are erect. Rays, when present, vary from bright yellow to maroon, depending on the place of origin.

Gaillardia amblyodon was described by Gay in 1839, and its first cultivation was in the Cambridge Botanical Gardens from seed collected in Texas by Lindheimer (Gray, 1846). The species is notable for its deep-maroon-red heads, and a similarly colored cultivar of G. pulchella ('Indian Chief') has been confused with it. The species has not been offered in any of the recent widely circulated catalogues which I have seen. Its deeply colored heads, produced in abundance all summer, give it horticultural possibilities. It is reproductively isolated from the other species in the genus.

Several other species, attractive in their native habitat, have not adapted well to my garden. Anyone interested in experimenting might try G. comosa, a lovely orange-flowered, dwarf-growing species of northern Mexico, the compact G. multiceps of gypsum areas of western Texas, New Mexico, and Arizona, or the cespitose G. Parryi with its lemon-yellow heads from the Arizona Strip country. The most unusual in appearance is G. suavis of Oklahoma, Texas, and northeastern Mexico, with its basal leaf rosettes and tall, wand-like stems topped by spherical rayless heads. This is the most fragrant species, and it makes up in unusual appearance what it lacks in color. The species is the only southern member of the genus which has been able to survive Michigan winters outdoors.

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Eranthis hyemalis and Eranthis × Tubergenii

George H. M. Lawrence

It is probable that the winter aconite, Eranthis hyemalis, subject of the accompanying figure, will be in full bloom in late February or early April, about the time of melting snows and lengthening days. It belongs in the buttercup family (Ranunculaceæ) and is usually propagated by division of the short, tuberous rootstock, or by sowing fresh seed. The tubers are usually planted in autumn.

Distinctive characters of the genus are the small, tubular, nectar-producing petals (sometimes designated nectaries), radiating from the central cluster of separate pistils and numerous stamens. Tubular petals occur also in Trollius, the globe-flower, but in that genus they are much longer, more cylindrical, and not 2-lipped.

Eranthis is a genus of a half-dozen or so species, native to Eurasia, all exceedingly hardy. In the United States the tubers are often planted in small clumps in the rock garden or in the perennial border, but in Europe one sees them massed under deciduous trees or scattered through the lawn as are crocuses. Once established, they usually persist for decades, and in the garden the species will spread by self-sowing. Mice, however, enjoy the tubers in severe winters.

Those plants native in Asia Minor have been treated conservatively by most botanists as a subspecies or variety of E. hyemalis (e.g., var. cilicica, as in Bailey's Manual), but the cytogenetic evidence of a sterile hybrid between this eastern taxon and the central European plants of typical E. hyemalis has caused more botanists to accept the taxa as representing two species: E. hyemalis (Linnaeus) Salisbury and E. cilicica Schott and Kotschy. This hybrid between the two is of horticultural origin and was produced by the Hoog brothers at their Haarlem bulb nurseries. It was named Eranthis Tubergenii by E. A. Bowles in 1924 in honor of their uncle, the late C. G. van Tubergen. The hybrid has been illustrated in color and described in Addisonia (vol. 16, t. 515, 1931) and in Curtis's Botanical Magazine (vol. 169, t. 196, 1952).

Eranthus × Tubergenii is horticulturally the most showy representative of the genus. Its flowers average 5-6 cm. across and, because they are sterile and set no seed, the plants remain in flower for twice as long a period, or longer, as do the parent species. It is reported that E. Tubergenii produces new tubers at a faster rate than do the parents, thus lending itself well to naturalizing. It is noted that the number of commercial sources carrying the plant in this country increases yearly. It is to be expected that it will become an increasingly popular early-spring-flowering item.

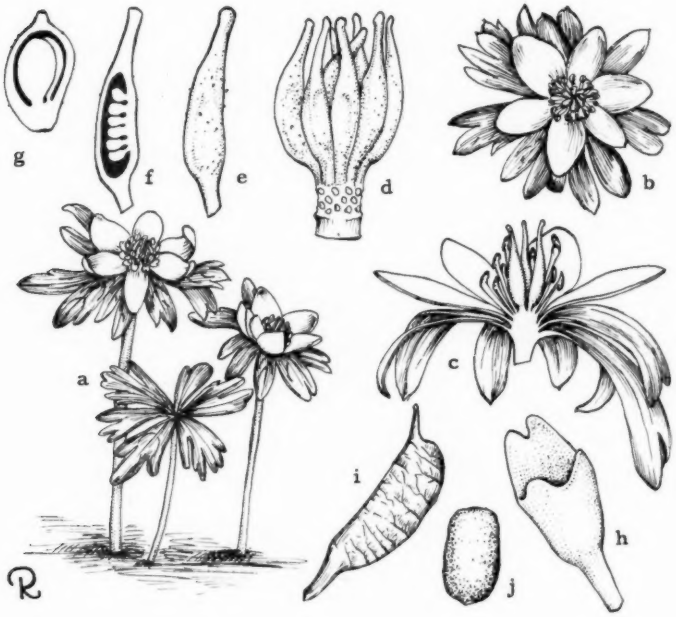

Fig. 5. Eranthus hyemalis: a, habit × 1/2; b, flower with subtending bract-leaves × 4/5; c, same, in vertical section × 1 1/2; d, central cluster of pistils × 3; e, single pistil × 3; f, same, in vertical section showing position of ovules × 3; g, pistil in cross-section × 9 1/2; h, tubular petal × 6 1/2; i, follicle, undehisced × 1 1/2; j, seed × 5.

Fig. 6. Solanum aculeatissimum. An herbarium specimen.

The Cultivated Species of Solanum

George H. M. Lawrence

The genus Solanum (of the Solanaceae) is important horticulturally for such food crops as the eggplant (aubergine) and potato and for a host of species of varying degrees of ornamental importance. It is a great genus, great in many ways. It numbers more than 1,500 species (how many, no one knows, since the last monograph of the genus was published in 1852 and hundreds of new species have been discovered and named since then). These species — while predominantly from the New World tropics — are native on all continents north of the antarctic and grow in habitats varying from cold subalkaline deserts to hot humid jungles. They exist in a myriad of habit types, varying from short-lived annuals to trees 10 meters tall, from weak, floppy herbs to tough woody vines, and from plants that are smooth and glabrous to those that are formidably spiny and prickly. Because of the vast scope of the genus, and with full cognizance of how little understood is the taxonomy of the species, it is only with hesitation that an account is presented here of the species reported to be in cultivation in this country.

This account parallels in coverage the species to be included in Hortus III. The key attempts to lead one to the identity of the species, but since it has been based on herbarium material and literature notes rather than on living plants, it is to be considered strictly provisional. Following it are some notes on nomenclature and inter-relationships, together with a list of those species in Hortus Second which will be dropped from the new edition of Hortus in the absence of evidence that plants of them are now available in this country. An accounting is given of the common names proposed for inclusion in Hortus III, and if other common names are known we would appreciate being advised of them. Likewise, we would welcome information on species omitted from this paper but known to be cultivated.

Key to the Cultivated Species of Solanum

1. Stems prickly or spiny, sometimes only sparsely so in S. integrifolium (other parts may or may not be prickly or spiny).
   2. Plants vine-like.
      3. Stems with stout hooked prickles intermixed with tufted hairs; leaves angularly lobed; fruit orange, 2.5 cm. in diam. . . . . S. Donnell-Smithii
      3. Stems prickly and glabrous; lower leaves pinnate and upper ones simple; fruit 7-10 cm. in diam. . . . . S. Wendlandii
   2. Plants erect, not vine-like.
      4. The plants annuals, or cultivated as annuals (S. tomentosum and S. Melongena are actually perennial).
         5. Leaves 1-2-pinnatifid; fruit more or less enclosed by a prickly calyx.
            6. Calyx loosely enclosing the red berry; anthers all equal in size and yellow; seeds reticulately pitted. . . . S. sisymbriifolium
            6. Calyx tightly and completely enclosing the berry; one anther much larger and purple, the others yellow; seeds coarsely undulate-rugose. . . . . S. citrullifolium
         5. Leaves simple, variously lobed or entire.
            7. Margins of leaves sinuately toothed; fruit scarlet or yellow, conspicuously ribbed. . . . . S. integrifolium
            7. Margins of leaves angularly lobed; fruit not ribbed.
               8. Herbage densely felty-tomentose, mostly tawny-colored; fruit globose, about 2 cm. in diam. . . . . S. tomentosum
               8. Herbage hairy but not felty-tomentose nor tawny-colored; fruit usually obovoid and more than 8 cm. long. . . S. Melongena
      4. The plants perennial, either herbaceous or woody.
         9. Leaves pinnate, the lobes undulate and entire. . . . . S. sodomeum
         9. Leaves simple, entire or variously margined.
            10. Margins of leaves entire (if lobed, see second 10 below).
               11. Flowers white; fruit very firm, with papery or parchment-like skin. . . . . S. aculeatissimum
               11. Flowers in shades of lavender, blue, or purple; fruit a soft berry with thin skin.
                  12. Leaves undulate; fruit ovoid and 10-15 cm. long. . . . . S. muricatum
                  12. Leaves flat, not undulate; fruit globose, usually less than 7 cm. in diam.
                     13. Fruit scarlet-red, scarcely 1 cm. in diam.; leaves white-tomentose beneath. . . . S. giganteum
                     13. Fruit yellow or orange, more than 2 cm. in diam.; leaves variously pubescent beneath but not white-tomentose.
                        14. Leaves linear or narrowly lanceolate, mostly 13-20 cm. long. . . . . S. lanceolatum

Fig. 7. Solanum giganteum. From Curtis's Botanical Magazine 44: t. 1921, 1817.

14. Leaves ovate to oblong, mostly 5-10 cm. long. . . . . .S. subinerme

10. Margins of leaves toothed or lobed (if entire and undulate, see 10 above).

15. Herbaceous perennials.

16. Leaf-margins sinuately toothed; calyx-lobes lanceolate-acuminate. . . . . S. carolinense

16. Leaf-margins lobed, the sinuses extending half-way to mid-rib or deeper.

17. Calyx-lobes broadly ovate, abruptly acuminate, not persisting on fruit; leaves scabrous; flowers 2.0-2.5 cm. across. . . . . .S. Torreyi

17. Calyx-lobes lanceolate, acuminate, persisting on fruit; leaves prickly on both sides; flowers about 1.5 cm. across. . . . . .S. khasianum

15. Shrubs, usually 1-2.5 m. tall or more.

18. Flowers white (sometimes veined purplish).

19. Leaves and stems rusty-stellate-hairy. . . . . .S. hispidum

19. Leaves densely white-stellate-hairy, becoming glabrescent above. . . . . S. marginatum

18. Flowers in shades of blue or purple (fading to white in S. mammosum).

20. Herbage velvety-pubescent, the leaves densely purplish-hairy beneath with showy green veins. . . . . .S. galeatum

20. Herbage variously pubescent but not velvety.

21. Leaves mostly 30-45 cm. long; flowers about 5 cm. across, several to many in pendulous axillary cymes to 13 cm. long; fruit globose. . . S. macranthum

21. Leaves 10-15 cm. long; flowers about 3.5 cm. across, solitary or few in erect short axillary cymes; cultivated for the showy ovoid fruit with basal nipple-like protuberances. . . . . S. mammosum

1. Stems lacking prickles and spines.

22. Plants vine-like.

23. Leaves all simple, the margins entire and sometimes undulate; plants usually of some degree of hairiness.

24. Stems woody throughout; flowers in paniculate cymes 7.5-10 cm. long; fruit red, 1.0 cm. in diam. . . . . S. tenuifolium

24. Stems basally woody; flowers few in axillary cymes 3.7 cm. long; fruit red, about 2.5 cm. in diam. . . . . S. macrantherum

23. Leaves pinnately lobed or compound, or at least some of them so; plants glabrous or essentially so.

25. Flowers 1.2 cm. across or smaller; plants of temperate regions. . . . . S. Dulcamara

25. Flowers 2.0 cm. across or larger; plants of the tropics and subtropics.

26. Leaves 2.5-7.5 cm. long, the lower ones pinnately divided and the upper ones generally simple; corollas bluish-white. . . . . S. jasminoides

Fig. 8. Solanum hispidum. An herbarium specimen.

26. Leaves 10-20 cm. long, the majority of them pinnate; corollas blue to purple. . . . . S. Seaforthianum

22. Plants not vine-like.

27. The plants annual or commonly cultivated as if so.

28. Leaf-margins entire (may be undulate); corollas 10 mm. long or longer.

29. Plant producing underground tubers (the common potato). . . . . S. tuberosum

29. Plant not producing tubers.

30. Leaves broadly ovate, the blades mostly 7-20 cm. long; fruit black (if fruit is black but leaf-blades are much smaller, see species under 28 below). . . . . S. intrusum[1]

30. Leaves ovate-lanceolate to oblong-lanceolate, mostly 2-5 cm. long; fruit orange, or white to scarlet-red.

31. Fruit globose, orange-colored. . . . . S. Pseudo-Capsicum

31. Fruit conical to ovoid, white to red. . . . . S. Capsicastrum

28. Leaf-margins toothed or lobed, or some of them so; corollas 3-7 mm. long.

32. Fruit dull black; anthers 1.8-2.4 mm. long. . . . . S. nigrum

32. Fruit glossy black; anthers 1.0-1.2 mm. long.

33. Leaf-blade about as long as petiole. . . . . S. Burbankii

33. Leaf-blade about twice as long as petiole. . . . . S. nodiflorum

27. The plants perennial herbs or woody shrubs.

34. Perennial herbs; fr. black. . . . . S. Douglasii

34. Shrubs.

35. Herbage variously hairy, the leaves usually densely so beneath.

36. Flowers white, mostly less than 12 mm. across.

37. Veins of younger leaves bright purple beneath; fruit red and tomato-like. . . . . S. quitonense

37. Veins of all leaves green beneath; fruit dark purple, about 2.5 cm. across. . . . S. verbascifolium

36. Flowers in shades of blue or purple.

38. Auriculate stipules present at each leaf-base, about 1.0-1.5 cm. long; the leaves velvety-tomentose. . . . . S. mauritianum

38. Auriculate stipules absent; the leaves not velvety-tomentose.

39. Hairs on stems forked or branched, or some of them so, without glandular tips; fruit whitish. . . . . S. umbelliferum

[1] See note on S. intrusum on p. 32.

Fig. 9. Solanum muricatum. From Garden and Forest 5: 173, 1892.

39. Hairs on stems simple, not forked or branched, but often gland-tipped.
    40. Stems conspicuously angled; corolla-lobes projecting beyond the broad limb as apiculate tips. . . . . .S. muticum
    40. Stems terete; corolla-lobes broadly triangular and short.
        41. Fruit green to purple, 6-8 mm. in diam.; stems and leaves greenish. . . . . S. Xantii
        41. Fruit dark purple, 12-25 mm. in diam.; stems and leaves densely tawny-villous. . . . . .S. Wallacei

35. Herbage glabrous, or essentially so.
    42. Leaves mostly 2-6.5 cm. long.
        43. Flowers 2 cm. across or larger.
            44. Leaf acute, 3-6.5 cm. long; fruit ovoid, blue. . . S. havanense
            44. Leaf obtuse, to 2.5 cm. long; fruit depressed-globose, probably greenish. . . . . S. pseudo-lycioides
        43. Flowers less than 1.2 cm. across; fruit mostly in shades of orange or red.
            45. Fruit globose, orange-colored. . . . . S. Pseudo-Capsicum
            45. Fruit conical to ovoid, white to scarlet-red. . S. Capsicastrum
    42. Leaves 7 cm. long or longer.
        46. Fruit red, heart-shaped, 2.0-2.5 cm. long, pendulous; leaf-blades undulate. . . . . S. Rantonnetii
        46. Fruit yellow, ovoid; leaf-blades not undulate, sometimes with 2-4 lanceolate lobes.
            47. Corolla-lobes half as long as the tube, emarginate. . . . . S. laciniatum
            47. Corolla-lobes about as long as the tube, obtuse. . .S. aviculare

Notes on Some of the Cultivated Species.

aculeatissimum Jacquin. [S. ciliatum Lamarck]. This is the love-apple, grown for its globose reddish-orange fruits, popular in dried floral arrangements. Although a subshrubby perennial, it is often grown as an annual.

auriculatum: a synonym of S. mauritianum.

aviculare G. F. Forster. Until recent years two closely related species of New Zealand and Australia, S. aviculare and S. laciniatum, have been treated as conspecific, with S. laciniatum the older and accepted name. Studies by G. T. S. Baylis (Transactions, Royal Society of New Zealand 82: 639-643, 1954) have shown each to be a distinct species; S. aviculare is found to be a diploid, distinguishable from S. laciniatum, a triploid, by the contrasting characters given in the key above. Both species are known in Australia and Hawaii as kangaroo-apple.

Fig. 10. Solanum muticum. From Gartenflora 43: t. 1401, 1894.

Burbankii Bitter is the plant Luther Burbank produced in 1905 as the Sunberry, later renamed Wonderberry, claiming it to have been a true-breeding hybrid selected from a cross of S. guineense and S. villosum. As pointed out by Soria and Heiser (Baileya 7: 33-35, 1959), it is highly improbable that Burbank's introduction was the result of crossing these two species. His early introductions included both black- and orange-fruited selections. Despite the use of this scientific name and its common names in current literature, no living material is known to be available. Seeds or plants of Burbank's stock are sought so that further study may be made as to probable origin and identity. See also under S. intrusum below.

Capsicastrum Link ex Schauer is the false-Jerusalem-cherry, popular as a pot plant during the Christmas season for its ovoid, pointed, scarlet to orange-red fruits. Cultivars include 'Melvinii', 'Nanum', and 'Variegatum'. The name 'Pattersonii' sometimes listed under this species is usually applicable to a cv. of S. Pseudo-Capsicum.

carolinense Linnaeus is the horse-nettle or ball-nettle, whose rhizomatous rootstocks have caused it to be better known as a pernicious weed than as an ornamental.

Clevelandii is properly S. Pseudo-Capsicum cv. 'Clevelandii', of which an improved selection is 'Cleveland Red'.

Craigii is S. Capsicastrum cv. 'Craigii'.

Donnell-Smithii Coulter is a large, spiny-hairy woody vine from Central America, currently offered as seed by one firm but not known to be established in this country as an ornamental. The Bailey Hortorium would be pleased to learn of its actually being grown.

Dulcamara Linnaeus is widely naturalized in temperate America but is a native of Europe. It is the scandent vine with clusters of soft currant-like scarlet-red berries to which the common name bittersweet properly belongs. The American-Asiatic genus Celastrus, the orange-red berries of which are prized for house decoration, is properly the false bittersweet, or, for the American species, the American-bittersweet.

giganteum Jacquin is a name found in a few current American trade lists. It is not known whether Jacquin's species, native in India and Ceylon and called African-holly, is actually the plant concerned. True S. giganteum, a prickly shrub, was cultivated sparingly in southern California twenty-five years ago and earlier, where it was prized for its showy bright-red berries. Information on its present availability is desired.

guineense (Linnaeus) Lamarck (based on S. nigrum var. guineense Linnaeus) is not the species named S. guineense by Linnaeus,

Fig. 11. Solanum Seaforthianum. From The Garden 42: t. 518, 1892.

and two species may not bear the same name. This is now S. intrusum Soria, which see.

hispidum Persoon [S. Warszewiczii Weich in Lamberteye], the devil's-fig, has been reported by C. T. White to be the correct name for this species (Kew Bulletin 1939: 666-668, 1939). The plant was first known from Peru and was named S. stellatum in 1799 by Ruiz and Pavon, but, unknown to them at that time, this name had been used by Jacquin in 1789 for a different species. Botanists have followed Persoon's use of the name S. hispidum since his application of it in 1805. However, when it was introduced to Europe as an ornamental more than a half-century later, its identity with Persoon's plant was not realized and Weich gave it the name now relegated to synonymy.

integrifolium Poiret is a spiny tropical annual known in many areas as the tomato-fruited-eggplant. It is sometimes confused in cultivation with S. aculeatissimum.

intrusum Soria is a relatively new name for the garden-huckleberry, distinguished from the related S. nigrum and S. nodiflorum by the leaf-blades' being twice as long as their petioles. (Since the publication of this name in Baileya 7: 33-35, 1959, Drs. Soria V. and Heiser have received a communication from Dr. K. J. W. Hensen, of Wageningen, The Netherlands, pointing out that the epithet intrusum is antedated by at least one, and possibly two, epithet(s) previously published for the plant in question [S. guineense (L.) Lam.]. It is expected that a future Baileya article will present the results of the investigation of this nomenclatural problem.)

khasianum C. B. Clarke is a densely yellow-hairy, prickly perennial, from western Assam, of which seed is currently offered. The plant should succeed in subtropical not-too-dry environments. No specimens of it from cultivation have been seen and we would be pleased to learn whether and where it is grown in this country.

laciniatum Aiton: see discussion under S. aviculare.

laurifolium is S. subinerme.

macrantherum Dunal is a woody unarmed vine, with simple ovate leaves 7-13 cm. long, from Mexico and was offered by the Monrovia Nurseries of California in 1953. No material of it from this introduction, or other cultivated source, has been seen and it is not known whether the species is grown in this country or not.

macranthum Dunal is the Brazilian potato-tree. Although usually a shrub when grown in California, it becomes a tree to 10 m. tall in the tropics.

mammosum Linnaeus, the nipple-fruit, is a small tropical American prickly shrub usually grown from seed as an annual, for its bizarre yellow or orange fruits with basal nipple-like protru-

Fig. 12. Solanum sisymbriifolium. An herbarium specimen of plant grown at the Strybing Arboretum, Golden Gate Park, San Francisco.

sions. It is not known to be grown now in continental United States, although it is seen occasionally in gardens in Hawaii.

mauritianum, published by Scopoli in 1788, was reported by Bitter (in Botanische Jahrbücher 54: 491-493, 1917) to be conspecific with S. auriculatum Aiton (1789). The latter name is now placed here in synonymy.

muricatum Aiton, known variously as pepino, melon-shrub, melon-pear, and pear-melon, produces an edible, firm-fleshed, violet-purple, aromatic, acid fruit. It is reported to be grown as a perennial or subshrub in Hawaii but is not known to us to be currently available on the mainland of this country. Plants grown as S. guatemalense probably belong here.

nigrum Linnaeus, the so-called deadly-nightshade, black-nightshade, or poison-berry, is an annual with tiny white flowers, the calyx-lobes not reflexed at maturity, and the berries dull black. The more common glossy-fruited plant generally grown under this name is now separated as N. nodiflorum Jacquin (see Stebbins, G. L. Jr. and Paddock, E. F. in Madroño 10: 70-81, 1949). For discussion of the garden-huckleberry, see under S. intrusum above.

Pseudo-Capsicum Linnaeus is the Jerusalem-cherry, distinguished from S. Capsicastrum by its globose scarlet or yellow fruits. Several cultivars are offered, including 'Clevelandii', 'Nanum', 'Pattersonii', and 'Tom Thumb'.

pseudo-lycioides Rusby is a much-branched, unarmed, glabrous shrub of Peru, recently offered as seed but not known to be established in cultivation. We would be pleased to have information as to whether and where it may be growing in this country.

quitoense Lamarck is the naranjilla of Ecuador, where its tomato-like fruits are used for a refreshing non-alcoholic beverage. It is currently grown in southern Florida.

Rantonnetii Carrière, the blue potato-bush, is a shrub from Argentina and Paraguay. Specimens of native material bear flowers scarcely 12 mm. across, but all cultivated material otherwise identifiable with it bears flowers that are about 25 mm. across and is presumed to be the selection introduced many years ago as var. grandiflorum and now designated as cv. 'Grandiflorum'.

sodomeum Linnaeus, known as the apple-of-Sodom and yellow popolo, is a spiny, weedy shrub grown for its large yellow globose fruit. It is reported from gardens in Hawaii, but we have no record of its being grown at present on the United States mainland.

Warczewiczii: see S. hispidum.

Wendlandii J. D. Hooker is the potato-vine, a prickly woody climber from Costa Rica with large trusses of showy lilac-blue flowers.

Fig. 13. Solanum Pseudo-Capsicum. From L. H. Bailey, How Plants Get Their Names.

In Hortus Second there are several species of Solanum reported as grown in this country during the decade prior to 1940, and which we propose to drop from Hortus III unless evidence is received that they continue to be in cultivation in the United States. These include:

aethiopicum	crispum	heterodoxum
amazonicum	crotonifolium	inaequale
arboreum	elaeagnifolium	robustum
atropurpureum	Gayanum	triquetrum
cornutum	gracile	

VINCA HERBACEA REPORTED TO BE HARDY.

In my account of the cultivated species of Vinca and Catharanthus (Baileya 7: 113-119, 1959) I repeated the oft-published statement that plants of Vinca herbacea are not hardy in cold-temperate regions.

Contradiction to this statement is now at hand from Dr. Frank L. Skinner of Dropmore, Manitoba, well-known for his work in developing hardy ornamentals that will withstand the rigors of Manitoban winters (see Baileya 5: 136-141, Sept. 1957). Contrasting his experience with the species V. herbacea and V. minor (the latter generally held to be fully hardy), he writes:

> "Vinca herbacea is quite hardy at Dropmore when grown on a sunny slope, and is completely herbaceous, dying down to a mere crown with nothing showing above ground in winter. On the other hand, the form of Vinca minor I had some years ago finally killed out completely with me. Recently I received a form that had proved hardy at Winnipeg and this seems more promising at Dropmore. Apparently there are differences in hardiness of the different geographical forms."

If further testing shows the Dropmore plants to represent a more hardy strain, a reassessment of our idea of hardiness of the species must follow. Persons interested in ground covers are invited to try this and advise us of their findings.

G.H.M.L.

ERRATA, VOLUME 7 (1959)

Page 35, line 19: for "Chronica Botanica 9: 446" read "Chronica Botanica 9: 456."

Page 63, lines 4 and 7 of key; p. 66, lines 17, 21, 24; p. 67, line 3; p. 68, line 1; p. 69, lines 19, 21, 23, 27, 38: for "corm" or "corms" read "tuber" or "tubers."

Page 77, line 2: for "cv. 'Variegata'" read "cv. 'Variegatus'."

Book Reviews

The Tree Identification Book, by George W. D. Symonds. 272 pp. 1539 photographs by Stephen V. Chelminski. Published by M. Barrows and Company, New York. 1958. $10.00.

This is a pictorial atlas showing the diagnostic features of trees native to eastern United States and adjacent Canada, exclusive of subtropical Florida. The book is designed primarily for the use of the amateur at plant identification, to enable him to identify and name the native trees by comparing his unknown plant material with a series of photographs of known plants.

The material is organized in two parts. Part one, which includes pages 15-136, is a series of seven pictorial keys dealing with opposite-growth characters, thorns, leaves, flowers, fruit, twigs and buds, and bark. These are not keys in the botanical sense, such as those employed in Bailey's Manual of Cultivated Plants, but are photographs of various plant parts with which one must compare one's specimen in order to determine the genus to which an unknown belongs. Following the pictorial keys, pages 131-136, is a section on the needle-leaved trees, for identifying the gymnosperms. Part two, pages 137-265, titled Master Pages, is designed to permit one to key a specimen to a species after its genus has been identified. The genera are arranged essentially according to the Engler system, beginning with the gymnosperms, continuing with the willows and finishing with the maples, catalpas, and viburnum. In the Master Pages, all the information about each genus and its species is assembled in one place, and includes pictures of the tree (shown in winter condition if deciduous), twigs, leaves, inflorescence, and fruit, and a close-up as well as a larger area of the trunk.

The book is written in strictly non-technical language, even to the point of using common names in preference to scientific ones; scientific names are given for each species, but the botanical authorities have been omitted. Since the plant-lover must rely on comparing his unknown with a series of pictures, he will find the keys dealing with opposite-growth characters, leaves, and flowers the most useful. The key dealing with bark, comprising 203 photographs and occupying 18 pages, probably will be the most difficult to use in the identification process, since one must examine each picture until one arrives at the appropriate one.

One feature of this work which will surely please its users is that the photographs of comparable structures, such as leaves, are all shown at the same scale, which is usually actual size. This being true, the book is a bit large for use as a field book in that it measures 8 3/4 × 11 1/4 inches and is about 1 inch

thick. The print is very readable and the photographs are mostly clear enough to permit one to see the details of the bark and the veining in the leaves. The pages are numbered in an unconventional method, the numbers being at the lower part of the page next to the binding, and thus are likely to be overlooked. However, these page numbers are never referred to, but, instead, each key, as well as the Master Pages, is numbered separately; these numbers appear on the outer side margins.

The author explains how his book should be used and what the amateur should look for when attempting to identify a tree. About 125 species of trees are treated in detail. The coverage is adequate for most genera, though, as the author states in his introduction, in large genera such as Quercus (the oaks) the number of species was intentionally limited to a few representative ones. Indeed, the genus Crataegus, comprising many large shrubs and small trees, and which has 103 species treated in Gray's Manual of Botany (1950), would be expected normally to have several species eligible for inclusion, but has only a general discussion of the genus. The author suggests that persons interested in further or more technical information should consult botanical treatments such as Rehder's Manual of Cultivated Trees and Shrubs. The appendix provides instructions for the use of botanical manuals and methods, and there is also a selected bibliography. A very limited glossary is included, and, probably in an attempt at being non-technical, such definitions as those of pinnate, sessile, and stipules are botanically inaccurate; however, the amateur will doubtless understand what is meant. The amateur who wants to identify trees on his own will find many hours of pleasure in using this book, and perhaps, too, it may inspire him to attempt to use more technical works.

J.I.

Illustrated Flora of the Pacific States, Volume IV, Bignonias to Sunflowers, by Roxana Stinchfield Ferris. viii and 732 pp., 1125 black and white figures. Stanford University Press, Stanford, California. 1960. $17.50.

With the appearance of this volume, the Illustrated Flora of the Pacific States stands completed. It most rightfully merits the adjective "monumental," a word that spontaneously comes to mind even without the prompting of the publisher's commendation on the dust jacket. The first volume was published as long ago as 1923 (reprinted, with corrections, in 1940), the second and third in 1944 and 1951 respectively, all under the authorship of Dr. LeRoy Abrams of Stanford University. Dr. Ferris, the author of this final volume, received her botanical training under Dr. Abrams, and it was at his request that she undertook to complete the work when Dr. Abrams (who died in 1956) realized that he would not be able to do this himself. As in the previous volumes, the treatments of certain plant groups have been prepared by specialists and authorities in those groups.

Volume IV is cast in the same format as the earlier volumes, and, since the latter have been so long available, it is likely that everyone interested in the flora of the Pacific states is already quite familiar with the general arrangement and the scope of the contents. For each family of plants, there is a key to the genera, and, following the generic descriptions, keys to the species. The information included for each species is concise and yet gratifyingly complete, especially in that a complete synonymy is included, with the bibliographic data for each name; the descriptions are ample; the notes on habitat and geographical range detailed (including designation of the type locality); and there is notation of the general flowering period. As in the other volumes, each species has been given a name in English (in addition to the technical name, of course), though as often as not it

seems to have been improvised for the occasion and cannot be considered a genuine common name. The black and white drawing illustrating each species, usually at one-half natural size (except for the diagnostic details), is of great value in aiding and confirming identification, particularly in difficult genera or when a particular specimen to be identified is lacking some diagnostic parts necessary to key it out.

Taxa below the rank of species are not keyed, but are listed, with the same completeness of synonymy and other pertinent information, following the species of which they are components.

Completing the whole work as it does, Volume IV contains, as an appendix, the key to all the families described in the four volumes, with the helpful addition of volume and page reference for each; and it concludes with two indices to the entire work, one of common names, the other of scientific names.

Amateur botanists perhaps should be cautioned that, in some instances, the nomenclature or taxonomic concepts to be encountered in the earlier three volumes, particularly in I and II, are not now generally accepted by professional taxonomists. This is due in part to Dr. Abrams' having been less conservative in his concepts of generic and specific limits than are most present-day American taxonomists, and in part to the changes in concepts and opinion that inevitably take place in any branch of science with the passage of time, as information resulting from new studies continually supersedes bits and pieces of the older body of knowledge.

W.J.D.

Dictionary of Economic Plants, by J. C. Th. Uphof. 400 pp. Published by H. R. Engelman, Weinheim, West Germany. 1959. $9.75. [Distributed in U. S. A. by Hafner Publishing Company, New York, N. Y.]

This book provides an alphabetic enumeration, adequately cross-referenced with common names and synonyms, of about 6,000 species of economic plants. The Latin name of each species is accompanied by an indication if the plant be a tree, shrub, or herb, by reference to the species' nativity, and by brief comment on its economic importance; when a timber tree, brief mention is made of its wood character. No attempt is made to provide distinguishing characters of the plant, other than to give the name of its family alliance. Vernacular names by which the plants are known in indigenous areas are given.

The author's concept of "economic" is broad in all respects, except that plants of ornamental value are excluded. Many included species are of economic value only to aborigines or people native to the same area as are the plants. Plants economically important as noxious weeds are omitted. Plants important for ornament as well as other—and sometimes lesser—economic uses rarely have their ornamental significance indicated. For these reasons, the book will be of greater utility to persons interested in food and crop plants, in timber and ethnobotanical subjects, and in medicinal and pharmacological plants than it will be to the gardener, nurserymen, or others concerned primarily with ornamentals.

In any ordinary work on economic botany one expects the author to employ those scientific names generally used for the plants concerned. But when this work is a dictionary, presented to the public, it must be an authentic scholarly production, a work to be consulted for the accuracy of its content, and the most up-to-date treatment available. In matters of plant taxonomy (including the technical subject of nomenclature) this book does not reflect knowledge of or, at least, acceptance of the wealth of taxonomic material published during the last quarter-

century in the world's botanical literature. Admittedly, a very large field is involved, probably larger than one person should attempt to encompass. This emphasizes the importance of collaboration in a work of this character, so that the published volume may be as accurate as possible.

The nomenclature in this book professes to follow directives of the International Code of Botanical Nomenclature "as far as it was feasible to do so." Determination of what is feasible becomes a matter of expedience, of opinion. The author's statement that "the nomenclature of the adaptation of the scientific names is close to that of the Index Kewensis and its Supplements" is unclear, since almost every scientific name of a plant — legitimate and illegitimate, valid and invalid — is given in Index Kewensis. This Index is only a nomenclator, not a "bible" for correct names. Moreover, one does not "adapt" scientific names. Some of the names used in this book have no scientific standing, e.g., Leguminosaceae for Leguminosae, Umbelliferaceae for Umbelliferae. Other names reflect either the author's unfamiliarity with or his rejection of those used in generally accepted published works of the last quarter-century, and for none is the accepted name given even in synonymy, e.g., Aconitum Fischeri is used for A. Carmichaelii, Albizzia Lebbek for Albizia Lebbeck, Aloe vera for A. barbadensis, Amelanchier canadensis for A. arborea, Artocarpus communis for A. altilis, Carya Pecan for C. illinoensis, Cupressus torulosa for C. Duclouxiana, Eucalyptus rostrata for E. camalduensis, Glycine Soya for G. Max, Juglans Sieboldiana for J. ailanthifolia, Juniperus mexicana for J. Deppeana, Paeonia albiflora for P. lactiflora, Pimenta acris for P. racemosa, Sequoia gigantea for Sequoiadendron giganteum, Thevetia nereifolia for T. peruviana, and Yucca filamentosa for Y. Smalliana.

A bibliography of over 500 titles concludes the work. In a book obviously intended for the English-reading public, it is surprising that so many English-language titles are omitted, although an abundance in other languages is included. Although individual articles of foreign periodicals properly are cited rather freely, one misses scores of excellent ones in English to be found in the journal Economic Botany. With full credit to the author for all that are included, it is this reviewer's belief that among important recent reference works omitted are, to mention a few: Aiyer, Y. N., Field Crops of India (1950); Bailey, L. H. and E. Z., Hortus Second (1941); Chittenden, F. J., The R. H. S. Dictionary of Gardening, 4 vols. and Suppl. (1951, '56); Fergus, Hammonds, and Rogers, Field Crops, including Southern Crops (1958); Font Quer, P., Diccionario de Botanica (1953); Grubb, N. H., Cherries (1949); Hedrick, U. P., A History of Horticulture in America to 1860 (1950); Hume, H. H., Citrus Fruits (1957); Muenscher, W. C., Poisonous Plants of the United States (1951); Muenscher, W. C. & Rice, M., Garden Spice and Wild Potherbs (1955); Oldham, C. H., Brassica Crops (1948); Schery, R. W., Plants for Man (1952); Smith, J. R., Tree Crops (1950); Webber, N. J. and Batchelor, L. D., The Citrus Industry, 2 vols. (1943-48); Wilson, H. K., Grain Crops, ed. 2 (1955).

The scope of the volume exceeds that of any other comparable modern work in English. The author has assembled more data on ethnic uses of plants, with generous inclusion of their vernacular names, than is known to be similarly available elsewhere. In these, and in all areas outside of the taxonomic, the volume deserves and will receive recognition as an important reference work. Writers and editors concerned with the broad general subject of plants and plant products will find it to be a must for ready reference.

The author has commendably invited "constructive criticism or advice which [will] lead to the improvement of future editions." The above are presented in this spirit, with full cognizance of the abundance of work and scholarly accomplishment embodied in this volume.

G.H.M.L.

ABBREVIATIONS USED IN BAILEYA

ann.	annual	dm.	decimeter	lf.	leaf
bien.	biennial	fl.	flower	lft.	leaflet
br.	branch	fls.	flowers	lvs.	leaves
brt.	branchlet	flt.	floret	mm.	millimeter
caps.	capsule	fr.	fruit	per.	perennial
cl.	clone	ft.	foot	segm.	segment
cm.	centimeter	hort.	horticultural	st.	stem
cv.	cultivar	in.	inch	sts.	stems
diam.	diameter	infl.	inflorescence	var.	variety

METRIC - ENGLISH EQUIVALENTS (approximate)

6 mm. - 1/4 in.	10 cm. - 4 in.	10 mm. - 1 cm.
12 mm. - 1/2 in.	1 dm. - 4 in.	10 cm. - 1 dm.
25 mm. - 1 in.	3 dm. - 1 ft.	10 dm. - 1 meter
2.5 cm. - 1 in.	10 dm. - 1 yd.	
5 cm. - 2 in.	1 m. - 39 in.	